

REMARKS

Claims 1-12 are currently pending in the subject application, and are presently under consideration. Claims 1-12 are rejected. Favorable reconsideration of the application is requested in view of the comments herein.

I. Rejection of Claims 4-6 and 10-12 Under 35 U.S.C. §112, First Paragraph

Claims 4-6 and 10-12 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Withdrawal of this rejection is respectfully requested for at least the following reasons.

In the Office Action dated January 22, 2008 (hereinafter "Office Action"), the Examiner asserts that claims 4-6 and 10-12 are non-enabling. Particularly, the Examiner states the following:

Claims 4, 6, 10, and 12 are directed to frequency reuse in UWB communications systems. However, UWB technology is an impulse radio or carrier-free wireless communication system. This means that there's no carrier frequency in the radio frequency spectrum. The UWB pulses are transmitted without modulation onto a sine wave carrier frequency. Therefore, the claims are not described in such a way as to enable one skilled in the art to pertain [sic]. (Office Action, page 2).

Claims 4 and 10 recite assigning to each user a unique combination of a UWB frequency, and claims 6 and 12 recite that a plurality of available frequencies are reused in a spatial sequence such that the beam associated with any user is spatially separated from other user beams using the same frequency. Representative for Applicant respectfully agrees that UWB technology is an impulse radio or carrier-free wireless communication system. However, Representative for Applicant respectfully submits that this fact is irrelevant to an evaluation of whether claims 4, 6, 10, and 12 are enabling for one of ordinary skill in the art to make and/or use the invention. Therefore, Representative for Applicant respectfully submits that the rejection of claims 4-6 and 10-12 under 35 U.S.C. §112, first paragraph, is improper.

Representative for Applicant respectfully submits that the Examiner appears to be unappreciative of the difference between an information carrying wireless signal and a carrier signal, such as onto which an information carrying signal is modulated. As is known in the art, and as admitted by the Examiner in the Office Action, UWB technology is an impulse radio or carrier-free wireless communication system. As such, is no carrier signal contained within the UWB pulses (Present Application, paragraph 2). However, UWB pulses are still wirelessly transmitted, and so must occupy a frequency band for wireless transmission (see *e.g.*, Present Application, paragraphs 1-3). As an example, the Present Application describes that "[t]he term UWB may also be applied to systems in which the transmitted pulses are bursts of a radio frequency carrier signal," and that "[a]n extremely narrow electromagnetic pulse inherently contains a wide band of frequencies," such that pulse position modulation can be used to carry information (Present Application, paragraph 1). UWB communication stands for "ultra-wide band", referring to the wide band of frequencies in which the communication system occupies (*Id.*).

Based on this information that is described in the Present Application and which is widely known in the art of any type of wireless communication, wireless transmission must occur at a given frequency or band of frequencies. That a communication system does not modulate an information carrying baseband signal onto a carrier signal is irrelevant to the claimed subject matter of claims 4-6 and 10-12. Specifically, because a wireless signal must be transmitted at some frequency, one of ordinary skill in the art would be enabled to assign to each user a unique combination of a UWB frequency, as recited in claims 4 and 10, and reuse a plurality of available frequencies in a spatial sequence such that the beam associated with any user is spatially separated from other user beams using the same frequency, as recited in claims 6 and 12. Therefore, for these reasons, withdrawal of the rejection of claims 4-6 and 10-12 under 35 U.S.C. §112, first paragraph, is respectfully requested.

In addition, Representative for Applicant notes that claims 4-6 and 10-12 have only been rejected under 35 U.S.C. §112, first paragraph. Therefore, Representative for Applicant

respectfully requests a statement of allowance of claims 4-6 and 10-12, pending allowance of the claims under 35 U.S.C. §112, first paragraph. Specifically, the MPEP states the following:

Office personnel must complete the patentability determination under all the relevant statutory provisions of title 35 of the U.S. Code.

Once Office personnel have concluded analysis of the claimed invention under all the statutory provisions, including 35 U.S.C. 101, 112, 102, and 103, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed in an Office action. The Office action should clearly communicate the findings, conclusions, and reasons which support them. When possible, the Office action should offer helpful suggestions on how to overcome rejections. (MPEP, §2163).

Therefore, Representative for Applicant infers that, because there is no substantive rejection of claims 4-6 and 10-12 under 35 U.S.C. §102 or 35 U.S.C. §103, that claims 4-6 and 10-12 are allowable in view of cited art. Accordingly, Representative for Applicant respectfully requests a statement of allowance of claims 4-6 and 10-12, pending allowance of the claims under 35 U.S.C. §112, first paragraph.

II. Rejection of Claims 1-3 and 7-9 Under 35 U.S.C. §103(a)

Claims 1-3 and 7-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2005/0090200 to Karaoguz, et al. ("Karaoguz") in view of U.S. Patent No. 7,042,417 to Santhoff, et al. ("Santhoff"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 1 recites a wideband antenna structure having multiple arrays, each array having multiple antenna elements. In the Office Action, the Examiner states that Karaoguz fails to disclose this element of claim 1, and thus relies on Santhoff (Office Action, page 3). Specifically, the Examiner asserts that Santhoff discloses a wideband antenna structure having

multiple arrays, each array having multiple antenna elements (Office Action, page 3; citing Santhoff, col. 4, ll. 55-67; FIG. 3). Representative for Applicant respectfully disagrees.

Santhoff discloses a UWB antenna array that employs a multi-element antenna for UWB beam forming (Santhoff, Abstract). However, Santhoff fails to disclose multiple antenna arrays, with each array having multiple antenna elements, as recited in claim 1. Specifically, the Examiner asserts that reference number 15 of FIG. 3 of Santhoff is equivalent to the multiple arrays of claim 1, and that reference number 20 of FIG. 3 of Santhoff is equivalent to the multiple antenna elements of claim 1. However, Santhoff discloses that reference number 15 is a single antenna element, and that reference number 20 is a UWB beam (Santhoff, col. 4, ll. 55-64). Santhoff discloses only a single UWB antenna structure with multiple elements (*Id.*, reference number 10), but fails to disclose multiple antenna arrays with each array having multiple antenna elements, as recited in claim 1. Therefore, neither Karaoguz nor Santhoff, individually or in combination, teach or suggest claim 1. Withdrawal of the rejection of claim 1, as well as claims 2 and 3 which depend therefrom, is respectfully requested.

Claim 3 recites the means for separating UWB pulses into individual user streams comprises means for applying each user stream to a different segment of the antenna. In the Office Action, the Examiner relies on Santhoff to teach claim 3 (Office Action, page 4; citing Santhoff, col. 5, ll. 1-8). Representative for Applicant respectfully disagrees. Santhoff discloses that signals can be fed to delay circuits having outputs that are provided to summing circuits prior to transmission (Santhoff, col. 5, ll. 1-8). However, Santhoff fails to disclose that the signals that are provided to the separate delay circuits correspond to individual user streams, or that the delays circuits correspond to different segments of the antenna. Instead, Santhoff discloses that the outputs of the summing circuits are provided to each of the four radiating elements to operate to form UWB beams in specific directions, as opposed to omni-directionally (Santhoff, col. 5, ll. 9-21). Thus, neither Karaoguz nor Santhoff, individually or in combination, teach or suggest claim 3. Withdrawal of the rejection of claim 3 is respectfully requested.

Claim 7 recites applying UWB pulses to a wideband antenna structure having multiple arrays of multiple antenna elements. For substantially the same reasons as described above

regarding claim 1, neither Karaoguz nor Santhoff, individually or in combination, teach or suggest claim 7. Withdrawal of the rejection of claim 7, as well as claims 8 and 9 which depend therefrom, is respectfully requested.

Claim 9 recites that the step of separating UWB pulses comprises applying each user's pulses to a different segment of the antenna structure. For substantially the same reasons as described above regarding claim 3, neither Karaoguz nor Santhoff, individually or in combination, teach or suggest claim 9. Withdrawal of the rejection of claim 9 is respectfully requested.

CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

Date 8 April 2008

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